Academic Program Assessment Report

Academic Year(s) Assessed: 2025-2026
College: College of Agriculture and College of Engineering
Department: Agricultural Economics & Economics and Mechanical & Industrial Engineering
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Submitted by: Carly Urban, Certifying Officer for EFIN programs

PROGRAM(S) ASSESSED

Majors	Minors, Options, etc.
Bachelor of Science in Financial Engineering (BS)	Financial Engineering (Minor)

Section 1. Past Assessment Summary.

The Assessment and Outcomes Committee (AOC) reviewed the Financial Engineering B.S. and minor assessment for AY 2024–2025 in spring 2026. Reviewers identified a clear, aligned assessment plan; multiple measures and evidence-based benchmarks; and compelling student-achievement and career-relevance evidence, including placement, alumni, and exit-interview information. They also identified improvements to carry into this cycle: (1) expand the broad, two-indicator PLO A rubric to evaluate problem formulation, choice of method/model, accuracy, interpretation or validation, and communication of reasoning; (2) strengthen direct evidence beyond a single examination question and the small prior sample (3 of 14), using additional prompts or applied projects; (3) formalize Career Services and alumni/employer engagement; and (4) explicitly connect assessment findings, planned industry engagement, and the proposed EFIN 300 course to future seven-year review evidence and resource needs.

Which PLO(s) are you assessing this cycle? Please include the description.	When was the last time you assessed this PLO(s)?	Action items from last assessment of this PLO(s).	Were past action items addressed in this reporting cycle? This will be discussed in depth in Section 4.
(b) data analysis and interpretation. Indirect evidence also relates to (c)–(e).	AY 2021–2022 (AOC reviewed spring 2023)	No action items were identified.	NA

Section 2. Actionable Research Question for Your Assessment.

To what extent do EFIN 301 students demonstrate competency in analyzing quantitative financial data, interpreting results, and drawing appropriate conclusions across multiple applied assignments? The assessment uses 15 student submissions from five problem sets to evaluate achievement of PLO B and identify areas for improvement in quantitative modeling, analytical accuracy, and interpretation.

To address this question, the program expanded its direct assessment from a single examination question to five

problem sets covering financial modeling, derivatives, hedging, risk management, insurance valuation, and simulation. Three student submissions were assessed from each assignment, providing 15 assessment artifacts. This expanded approach provides broader evidence of student achievement and helps identify specific strengths and opportunities for improvement in quantitative reasoning and financial analysis.

Section 3. Assessment Plan, Schedule, and Data Sources.

a) Did you change the previously established Assessment Plan Schedule. If yes, how was it changed?

No.

b) Please provide a multi-year assessment schedule that will show when all program learning outcomes will be assessed, and by what criteria (data).

ASSESSMENT PLANNING SCHEDULE CHART

PLO#	PROGRAM LEARNING OUTCOME	2024-2025	2025-2026	2026-2027	2027-2028	Data Source
A	Apply knowledge of mathematics, economics, engineering, and computing to identify, formulate, design and assess solutions	X				EFIN 401 Exam
B	Analyze data, interpret results, and draw appropriate conclusions		X			EFIN 301 Assignments
C	Communicate effectively with a range of audiences			X		EFIN 499 Final Project
D	Function effectively on inter-professional teams			X		EFIN 499 Final Project
E	Recognize professional and ethical responsibilities in the conduct of their work and make informed judgements that consider cultural, societal, and environmental impacts				X	EIND 300 Assignment

(c) What are the threshold values for which your program demonstrates student achievement? Provide a rationale for your threshold values.

Student achievement is evaluated using a four-point rubric: Beginning (1), Developing (2), Competent (3), and Accomplished (4). The assessment evaluates two performance thresholds: at least 75% of assessed submissions scoring 2 or higher and at least 75% scoring 3 or higher. The primary competency benchmark is the latter threshold. Student work from EFIN 301 Problem Sets 2–6 serves as the direct assessment evidence.

PROGRAM LEARNING OUTCOME	Threshold Value	Data Source
(b) Analyze data, interpret results, and draw appropriate conclusions	The threshold value for this outcome is for 75% of assessed students to score above 2 on a 1-4 scoring rubric	Randomly selected student responses from EFIN 301 Problem Sets 2-6

Section 4. What Was Done?

a) **Self-reporting Metric (required answer):** Was the completed assessment consistent with the program's assessment plan? If not, please explain the adjustments that were made.

☑ **Yes** ☐ **No**

b) How was the data collected and analyzed and by whom? Please include method of collection and sample size.

The instructor for EFIN 301 provided student work from Problem Sets 2, 3, 4, 5, and 6 during Spring 2026. A total of 15 submissions were assessed, with three submissions randomly selected from each problem set. Assignments involved advanced quantitative financial analysis, including probability modeling, arbitrage, futures markets, hedging, option pricing, insurance valuation, and Monte Carlo simulation. Students submitted typed responses, calculations, and computer-generated analyses using R. The student work was evaluated using the four-point PLO rubric measuring the ability to analyze data, interpret results, and draw appropriate conclusions. ChatGPT was used to assess the submissions relative to the rubric, assign performance levels, and summarize the results. Scores were then compiled to determine the average performance and percentage of submissions meeting or exceeding competency.

The FESC also reviewed data from job placement data and senior exit interview data. Below are trends and analysis.

Job Placement

89% of the Financial Engineering graduates whose job placement information is available (85 out of 100 students) from 2016–2025 are employed. 79% of all graduates (both employed and those whose job placement status is known) are in relevant roles, as 88% of employed graduates are working in occupations related to their degree.

For 2024, 71% of the 7 graduates with known job placement status are employed, and 100% of them are in relevant roles.

For 2025, 100% of the 10 graduates with known job placement status are employed, and 90% of them are in relevant roles.

Given that 89% of all graduates for whom we have job placement information from 2016-2025 are employed, and 88% of their positions are in a related field, we can conclude that 79% of our graduates have found relevant jobs. This is above the 75% threshold, indicating that the program prepares students well for the job market

In 2025, the program demonstrated a significant rebound with a 100% employment rate among graduates with known outcomes. A high proportion, 90%, of these roles were in relevant fields. This cohort also marked a strong return to the program's core strengths, with 80% of employed graduates taking finance-related positions, indicating renewed demand in the primary job sector.

In the future, we should systematically collect data on the tools, knowledge, and skills our graduates find lacking during job interviews and in their first year of employment. This information can help us better align our curriculum with industry expectations. I recommend further expanding the data analytics and machine learning components of our program to meet this growing demand.

Notably, the 2025 Financial Engineering capstone class demonstrated exceptional job placement outcomes, thanks in large part to our partnerships with major companies such as WTW, FM Global, and Liberty Mutual. These collaborations provided students with hands-on experience in solving real-world problems and direct exposure to professional environments. Several students secured internships and full-time roles as a direct result of these projects.

Moreover, invited lecturers from leading finance, insurance, and banking institutions across major financial hubs in the US, Germany, the UK, and Bermuda greatly enriched the students' learning experience. These sessions introduced emerging topics in risk modeling and management and offered valuable networking opportunities beyond Montana and even outside the US. This global exposure significantly enhanced students' career readiness and broadened their job prospects across sectors and countries.

The FESC also reviewed three courses (EIND 468, EFIN 301, and EFIN 305).

EIND 468 – Managerial Forecasting and Decision Analysis

A review of the syllabus, exams, problem sets, and projects for EIND 468: Managerial Forecasting and Decision Analysis shows that the course is designed to meet the learning outcomes for the program. In particular, the course integrates topics related to mathematics, statistics, economics, engineering, and computing to inform strategic managerial decision-making. This integration is achieved through a software-agnostic approach in which students may use Minitab or the programming language or software package of their choosing for regression analysis, data display, and forecasting. The topics covered, including regression, smoothing models, advanced time series models, and modern machine learning methods, are consistent with a course that seeks to focus on using predictive analytics to forecast future trends and events to better inform complex business and engineering problems. More generally, this curriculum is designed to allow students to select and apply appropriate forecasting tools, judge model adequacy, and evaluate the risks and uncertainty in a forecast through homework, mini-projects, exams, and a computational project. The course objectives provide a roadmap for students to be able to build appropriate forecasting models while using real data and statistical theory, providing a critical foundation for students to progress in the financial engineering program into more complex analytical tools and processes.

EFIN 301 - Engineering & Economic Financial Management I

The course is well structured and provides a comprehensive introduction to the principles and applications of financial engineering. The course schedule is logical, and the topics covered align well with the current course outcomes. The progression of content supports student learning and allows students to build both conceptual understanding and quantitative problem-solving skills throughout the semester.The problem sets are extensive, rigorous, and cover the relevant material in sufficient depth. These assignments provide students with meaningful opportunities to apply course concepts and develop proficiency in financial analysis, derivative valuation, risk management, numerical methods, and computational modeling. Collectively, the coursework appears to provide students with a strong foundation for achieving the intended learning outcomes.While the current course outcomes generally align with the course content, a revision is recommended to improve clarity, measurability, and alignment with contemporary financial engineering practice. The revised outcomes would better reflect the breadth of topics covered in the course, including derivative pricing, hedging, computational methods, stochastic modeling, and financial decision-making. The proposed outcomes are as follows: 1. Explain the role, benefits, applications, and limitations of financial engineering in managing financial risk, valuing assets, and supporting investment decisions.

Feedback from graduates has been consistently positive. Students frequently identify this course as one of the first opportunities in the curriculum to apply their computing and analytical skills to realistic, real-world problems. The practical nature of the assignments and modeling activities helps students recognize the relevance of quantitative methods in financial decision making and risk analysis.

Overall, this course provides significant value to students by integrating mathematics, computing, engineering economics, and financial analysis into an applied learning experience. The course remains highly relevant, supports important program learning objectives, and is strongly recommended for continued inclusion in the

curriculum. Future offerings should retain the current structure and content while considering the proposed revision of the course outcomes to better reflect the knowledge and skills developed throughout the course.

EFIN 305 – R Lab Class I
This course is one-credit hands-on laboratory course designed to complement EFIN 301 (Financial Engineering I) by developing students' practical skills in using R programming for financial engineering applications. The course focuses on acquiring and preparing financial data from various sources, creating figures and tables to visualize and interpret financial information, and applying financial tests and ratios to support financial analysis. Students also learn to characterize financial data and implement simulation techniques to estimate risk parameters and evaluate financial outcomes. Through applied programming exercises and problem sets, students gain experience using R to analyze financial data, implement financial models, and assess financial risk.

c) Please provide a rubric for each PLO being assessed that demonstrates how your data was evaluated. (See Instructions document for an example of what this could look like.)

Outcome	Beginning - 1	Developing - 2	Competent - 3	Accomplished - 4
Analyze data, interpret results, and draw appropriate conclusions.	Unable to analyze data, interpret results, or draw appropriate conclusions	Analyzes data but makes errors in interpretation or draws incomplete conclusions	Correctly analyzes data, interprets results, and draws supported conclusions with minor errors.	Accurately analyzes data, interprets results without error, and clearly explains conclusions and their implications.

Section 5. What Was Learned

a) Based on the analysis of the data, and compared to the threshold values established, what was learned from the assessment? (Relate this to your research question in Section 3.)
The direct assessment of PLO B demonstrates that the competency benchmark was achieved, with 13 of 15 submissions (86.7%) receiving scores of 3 or higher. The mean rubric score was 3.20. These results complement the program's positive graduate employment outcomes, although employment data are indirect measures and should be interpreted separately from direct student-learning assessment.

Assignment	n	Score 1	Score 2	Score 3	Score 4	% scoring 2+	% scoring 3+
PS 2	3	0	0	1	2	100%	100%
PS 3	3	0	0	1	2	100%	100%
PS 4	3	0	0	3	0	100%	100%
PS 5	3	0	1	1	1	100%	66.7%

PS 6	3	0	1	2	0	100%	66.7%
Combined	15	0	2	8	5	100%	86.7%

Compared with employment thresholds: The available graduate-placement indicator exceeds the workbook's suggested 75% related-employment threshold: 79% of graduates with known outcomes from 2016–2025 were in related jobs. The 2024 cohort had 71% employment among seven graduates with known status; all employed graduates were in related roles. The 2025 cohort had 100% employment among ten graduates with known status, with 90% of employed graduates in related roles and 80% in finance-related positions. These are indirect career outcomes, not direct measurements of student PLO achievement.

b) What areas of strength in the program were identified from this assessment process?
The EIND 468 course review identifies integration of mathematics, statistics, economics, engineering and computing through forecasting, regression, time-series methods and machine learning, with student choice of analytical software. The EFIN 301 review describes rigorous problem sets and applied financial analysis, derivatives, risk management, numerical methods and computational modeling. Graduate-placement review highlights capstone collaborations with WTW, FM Global and Liberty Mutual, as well as invited industry speakers and employment outcomes for the 2025 cohort.

c) What areas were identified that either need improvement or could be improved in a different way from this assessment process?
The assessment identified opportunities to improve computational accuracy, model validation, and interpretation of financial results. The program will continue refining measurable course outcomes and strengthening instruction in derivative valuation, hedging, numerical methods, stochastic modeling, and communication of analytical conclusions. Future assessments will use multiple assignments to provide broader evidence of student achievement and monitor progress over time. Additional opportunities include systematically collecting employer and alumni feedback and expanding instruction in data analytics and machine learning.

Section 6. How We Responded.

a) Describe how "What Was Learned" was communicated to the department, or program faculty. How did faculty discussions re-imagine new ways program assessment might contribute to program growth/improvement/innovation beyond the bare minimum of achieving program learning objectives through assessment activities conducted at the course level?
The EFIN Steering Committee met in August 2026 to discuss the status, updates, and what has been learned regarding the EFIN curriculum and assessments. The assessment results identified strong student performance in applied quantitative financial analysis, with 86.7% of assessed submissions achieving competency or higher. The assessment also highlighted opportunities to strengthen computational accuracy, model validation, and interpretation of financial results. Expanding the assessment to five assignments and 15 student submissions provided a more comprehensive evaluation of student learning than the previous approach based on a single examination question.

These findings provide a basis for continued faculty review of course outcomes, assignment design, and assessment practices. The program will emphasize consistent application of quantitative methods, verification of computational results, and clear communication of analytical conclusions. Future assessments will continue to draw on multiple assignments to monitor student achievement and identify opportunities for curricular improvement.

b) How are the results of this assessment informing changes to enhance student learning in the program?
The expanded assessment identified strengths in applied quantitative analysis, financial modeling, and risk management, along with opportunities to improve computational accuracy, model validation, and interpretation. The program also strengthened industry engagement through more than eight outside speakers in each of EFIN 101 and EFIN 499. Approval of EFIN 300 for implementation in Fall 2027 represents an additional curricular improvement. Future assessment cycles will monitor student performance across multiple assignments and evaluate how these curricular and industry-engagement initiatives contribute to student learning and career preparation.

c) If information outside of this assessment is informing programmatic changes, please describe that.
Graduate employment outcomes, alumni feedback, industry engagement, and course reviews provide additional information informing program improvements. Among graduates with known employment outcomes, a high percentage have secured positions related to their degrees, demonstrating continued demand for financial engineering skills. Industry partnerships with organizations such as WTW, FM Global, and Liberty Mutual have also provided applied learning opportunities through capstone projects, internships, and professional engagement.

These external indicators complement the direct assessment results and reinforce the importance of quantitative modeling, data analytics, risk management, and professional communication in the curriculum. Continued engagement with employers and alumni will help identify emerging skill requirements and inform future curricular adjustments.

d) What support and resources (e.g., workshops, training, etc.) might you need to make these adjustments?
Continued program improvement will require faculty time to coordinate assessment activities, evaluate student work across multiple assignments, and refine learning outcomes and assessment rubrics. Additional support for industry engagement, including guest speakers, employer partnerships, and alumni outreach, will help maintain strong connections between the curriculum and professional practice.

The implementation of EFIN 300 beginning Fall 2027 will also require appropriate instructional resources and coordination within the Financial Engineering curriculum. Maintaining access to computational software, financial data, and applied learning opportunities will be important as the program continues to emphasize quantitative analysis, financial modeling, and career preparation. These activities will contribute to the evidence base for the next seven-year program review.

Section 7. Closing the Loop(s).

a) Self-Reporting Metric (required answer): Based on the findings and/or faculty input, will there be any changes made (such as plans for measurable improvements, realignment of learning outcomes, curricular changes, etc.) in preparation for upcoming assessments?

☐ **Yes** ☑ **No**

b) In reviewing the last report that assessed the PLO(s) in this assessment cycle, what changes proposed were implemented and will be measured in future assessment reports? What action will be taken to improve student learning objectives going forward?
The program implemented several improvements identified in the previous assessment cycle. Direct assessment was expanded from a single examination question to five assignments in EFIN 301, with 15 student submissions evaluated using a four-point rubric. This broader assessment provided stronger evidence of student

achievement and identified opportunities to improve computational accuracy, model validation, and interpretation of results.

Industry engagement was also expanded through EFIN 101 and EFIN 499, with each course featuring more than eight outside speakers. In addition, EFIN 300 was approved for implementation beginning Fall 2027, strengthening the program's curriculum and applied learning opportunities.

Future assessments will continue to evaluate student performance across multiple assignments, monitor improvements in quantitative analysis and interpretation, and assess the contributions of curricular changes and industry engagement to student learning and career preparation.

c) Have you seen a change in student learning based on other program adjustments made in the past? Please describe the adjustments made and subsequent changes in student learning.
Not determinable. Course reviews describe alignment and perceived strengths but provide neither before/after student rubric scores nor longitudinal comparisons. The 2025 placement rebound is a career outcome and cannot alone establish a causal change in learning.

d) If the program sees anything emerging from this assessment cycle that it anticipates would be a factor or an item of discussion in its 7-year program review cycle, please use this space to document that for future reference.
Potential 7-year review considerations: Maintain longitudinal evidence of graduate employment and related-field placement; evaluate capstone/industry engagement; assess alignment of quantitative computing, data analytics, machine learning and risk-management instruction; and improve the completeness and consistency of direct PLO assessment records.

Appendix A. Scoring summary and rationales (PLO B)

Competency threshold = 3 or higher. A score of 4 was allowed for correct application at the individual student level.

EFIN 301, Practice Problem 2 (3 randomly selected students, anonymized)

Student	Score	Rationale
301-01	4	Strong probability, arbitrage, and futures analysis. Minor computational errors and limitations in interpreting hedging risk.
301-02	3	Correct application of several quantitative methods. Arbitrage errors and some incomplete financial interpretations.
301-03	4	Accurate financial analysis and well-supported conclusions. Optimization implementation incomplete.

EFIN 301, Practice Problem 3 (3 randomly selected students, anonymized)

Student	Score	Rationale
301-04	4	Strong statistical modeling, revenue-risk analysis, and insurance pricing. Minor computational inconsistency.
301-05	4	Comprehensive quantitative analysis and insurance valuation. Some implementation

		and premium calculation errors.
301-06	3	Competent financial risk modeling. Errors in statistical measures and insurance premium calculations.

EFIN 301, Practice Problem 4 (3 randomly selected students, anonymized)

Student	Score	Rationale
301-07	3	Competent hedging and stochastic analysis. Errors in regression specifications and futures calculations.
301-08	3	Sound application of financial risk models. Some regression and numerical inconsistencies.
301-09	3	Competent quantitative risk analysis. Some calculations and conclusions insufficiently supported.

EFIN 301, Practice Problem 5 (3 randomly selected students, anonymized)

Student	Score	Rationale
301-10	4	Accurate option pricing, implied volatility, and sensitivity analysis. Minor computational errors.
301-11	3	Competent option pricing and risk interpretation. Incomplete futures-option analysis.
301-12	2	Sound conceptual understanding but significant model specification and implementation errors.

EFIN 301, Practice Problem 6 (3 randomly selected students, anonymized)

Student	Score	Rationale
301-13	2	Applies simulation and insurance methods but significant inconsistencies undermine conclusions.
301-14	3	Extensive simulation, hedging, and insurance analysis. Some modeling and interpretation limitations.
301-15	3	Competent simulation and risk analysis. Insurance assumptions and model validation need improvement.